providing a wellbore tubular downhole, wherein the cable system define above is arranged on an outside of said wellbore tubular;

lowering a magnetic orienting tool into the wellbore tubular;

locating the cable system through the wellbore tubular wall with the magnetic orienting tool;

subsequently perforating the metal wall of the wellbore tubular away from the cable system.

[0013] Unless otherwise specified, all materials-related parameters, including magnetic permeabilities, conductivity, resistivity, are defined at 20° C.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The drawing figures depict one or more implementations in accord with the present teachings, by way of example only, not by way of limitation. In the figures, like reference numerals refer to the same or similar elements.

[0015] FIG. **1** shows a perspective view of a tubular element provided with a fiber optic cable system;

[0016] FIG. **2** shows a cross sectional view of the tubular element of FIG. **1** and an embodiment of a fiber optic cable system according to the present disclosure;

[0017] FIG. **3** shows a cross sectional view of a section of the tubular element of FIG. **1** and another embodiment of a fiber optic cable system;

[0018] FIG. **4** shows a side view of a fiber optic cable system mounted on the tubular element;

[0019] FIG. **5** shows a cross sectional view of the tubular element of FIG. **1** and an embodiment of a fiber optic cable system;

[0020] FIGS. **6** to **14** show a cross sectional views of respective embodiments of a fiber optic cable system according to the present disclosure;

[0021] FIG. **15** shows a cross sectional view of an embodiment of a fiber optic cable system placed in between multiple tubulars;

[0022] FIG. **16** shows a cross sectional view of an embodiment of a fiber optic cable system placed on the outside of multiple tubulars;

[0023] FIG. **17** shows a partially cut-out view of a tubing connection comprising a marker as an exemplary embodiment;

[0024] FIG. **18** shows a perspective view of another embodiment for locating a device using high EM contrast material in form of a tape; and

[0025] FIG. **19** shows an exemplary diagram indicating signal strength with respect to background signals (horizontal axis) versus a number of detection hits (vertical axis) for various optical cable systems.

[0026] These figures are schematic and not to scale. Identical reference numbers used in different figures refer to similar components. Within the context of the present specification, cross sections are always assumed to be perpendicular to the longitudinal direction.

DETAILED DESCRIPTION OF THE INVENTION

[0027] The person skilled in the art will readily understand that, while the detailed description of the invention will be illustrated making reference to one or more embodiments, each having specific combinations of features and measures, many of those features and measures can be equally or similarly applied independently in other embodiments or combinations.

[0028] The present description may make reference to hydraulic cable, electric cable, or fiber optic cable. For the purpose of interpretation hydraulic cable generally comprises at least one hydraulic line, an electrical cable generally comprises at least one electric line, and a fiber optic cable generally comprises at least one fiber optic line (typically an optical fiber).

[0029] Parts of the present disclosure are directed to a system for magnetic orienting across a metal wall of a device that is arranged on one side of the metal wall. The system may comprise:

[0030] a device adapted to be arranged on one side of the metal wall; and

[0031] a magnetic-permeability element, provided at, near or connected to the device, comprising a material having a relative magnetic permeability (μ_r) of at least 2000.

[0032] Specifically, the invention may relate to a magnetically detectable cable system, wherein the device may be a cable with the magnetic-permeability element configured along a length of said cable. Typically, a cable may comprise an elongate cable body defining a direction of length, and a functional line (such as a hydraulic, an electric, or an optical line) configured along the length of the elongate body. The magnetic-permeability element is configured and/or distributed along at an interval of the elongate body in the direction of length.

[0033] The relative magnetic permeability μ_r of the material of the magnetic-permeability element is preferably higher than that of the material of the metal wall. The relative magnetic permeability μ_r of the material of the magnetic-permeability element may suitably be at least 20 times higher than the relative magnetic permeability of the material of the metal wall. Herewith a significant contrast can be achieved between magnetic detectability of the magnetic-permeability element against the background magnetic permeability of the metallic wall, without needing excessive amounts of mass of the magnetic-permeability element.

[0034] Suitably, the material of the magnetic-permeability element may have an EM contrast ratio of at least $20/\mu\Omega \cdot cm$, wherein EM contrast is defined as $\mu_r \cdot \sigma$ wherein σ is the specific conductivity of the material. Generally, this corresponds to μ_r/ρ wherein ρ is the resistivity of the material. Preferably, the material has an EM contrast ratio of at least $50/\mu\Omega \cdot cm$.

[0035] The contrast between the magnetic detectability of the magnetic-permeability element and the metallic wall is also impacted by the masses of each of the magnetic-permeability element and the metallic wall that are probed in a certain sampling area. A target-to-background ratio of equivalent inductive mass (EIm) is preferably selected to exceed 5. More preferably, the target-to-background ratio is selected to exceed 15. The term "target-to-background ratio" as used herein means ratio of EIm of the magnetic-permeability element over the EIm of the metal wall in the same area that is covered by the magnetic-permeability element. EIm is defined as mass$\cdot\mu_r\cdot\sigma$.

[0036] The metal wall may be the wall of a wellbore tubular. The device may suitably comprise an optical fiber. The material may be selected from the group of: mu-metal, permalloy, and non-oriented electrical steel. The material